

# EXECUTIVE SUMMARY

## Fish Screen Feasibility Study (Phase I) - Hastings Tract

Applicant  
Hastings Island Land Company

JUL 28 1997

### Project Description & Primary Biological/Ecological Objectives:

The hundreds of miles of rivers and sloughs in the Sacramento/San Joaquin Delta are home to many resident and anadromous fish species. The delta smelt is a resident species which is listed as "threatened" by state and federal governments. The delta smelt is a small, slender-bodied fish, found only in the Sacramento-San Joaquin Estuary. Delta smelt are found in brackish water only; however, they migrate to freshwater to spawn where larvae hatch and migrate downstream to brackish water. Since 1983, the decline of delta smelt population has been noted. One of the threats to the population of delta smelt has been entrainment in water diversions.

Delta smelt populations are known to occur in Cache and Lindsay Slough in the northwest Delta. Cache Slough has been designated by the United States Fish and Wildlife Service as "critical habitat area" for delta smelt. To reduce the entrainment of delta smelt and other fish species, Hastings Island Land Company proposes to install fish screens on its gravity intake pipes and relocate the pipes from Cache Slough to Lindsay Slough. Other species expected to benefit are longfin smelt, all runs of chinook salmon, steelhead, and striped bass

### Approach/Tasks/Schedule:

The completion of the proposed project would involve two phases. The first phase of the project is a feasibility report consisting of the following studies:

- Technical Study — Nov. 1997 to Jan. 1998
- Biological Study — Nov. 1997 to Mar. 1998

Fish screen alternatives would be developed, from which a preferred alternative would be chosen for phase two, construction.

- Engineering & Design — Feb. 1998 to Aug. 1998
- Biological Consultation — Feb. 1998 to Aug. 1998
- Regulatory Permits & Consultation — Feb. 1998 to Jul. 1998
- Construction — Aug. 1998
- Post-Project Monitoring — Aug. 1998 to Nov. 2001
- Maintenance — Aug. 1998 to Nov. 2001

### Justification:

The proposed project addresses one of CALFED's stressor categories, benefits multiple species, is consistent with CALFED's long term objectives, and has no third-party or redirected impacts. Therefore, funding is requested in the amount of 100% to complete Phase I--feasibility report. Construction funding would be requested from CALFED and other sources at a later time should the project prove feasible.

**Budget Costs:**

Funding is requested at this time for the Phase I-Feasibility Study as follows:

Technical Study	—	\$ 12,000
Biological Study	—	\$ <u>15,000</u>
Total Cost		\$ 27,000

Construction would be requested at a later time should Hastings Island Land Company proceed with construction. Funding sources would be CALFED, CVPIA Unscreened Diversion Program and other funding possibilities.

**Third Party Impacts:**

There are no anticipated third party impacts associated with the project.

**Applicant Qualifications:**

This proposal is submitted by Murray, Burns and Kienlen, Consulting Civil Engineers of Sacramento, California, on behalf of Hastings Island Land Company. MBK has represented the landowner and the reclamation district as engineer for over 20 years and has been retained to secure CALFED funding, prepare technical and biological studies, engineering design, post-project monitoring and procurement of any subcontracts.

MBK is a consulting civil engineering firm whose main emphasis is water resources. Its three main areas of specialization include water supply planning, flood control and water rights. MBK represents many water diverters located in the Sacramento/San Joaquin Delta watershed. This association has resulted in MBK personnel involvement in many existing and planned fish screening facilities. The services provided include feasibility design and environmental/regulatory. The list of projects includes Pelger Mutual Water Company, Deseret Farms Wilson Ranch, Maxwell Irrigation District, Lower Joice Island, Thousand Acre Ranch, Browns Valley Irrigation District, Grizzly Island and King Island.

**Monitoring and Data Evaluation:**

Should the fish screen be constructed, the project would be monitored for biological effectiveness and mechanical performance of the fish screen. A technical report would be prepared after each irrigation season to document mechanical performance of the fish screen and cleaning system. Biological monitoring would focus on both hydraulic and biological criteria.

**Local Support/Coordination With Other Program/Compatibility with CALFED**

If the proposed project proceeds to phase two, the final design and specifications of the fish screen would incorporate advice from Department of Fish & Game, United States Fish and Wildlife Service, and National Marine Fisheries Service for expedient permit approval. Permits or approvals will be obtained from the Corps of Engineers, Department of Fish & Game Streambed Alteration Agreement, and the Central Valley Regional Water Quality Control Board. Cost share by Hastings Island Land Company would be means of long-term operation and maintenance of the fish screen and in-kind services during post-project monitoring.

**FISH SCREEN FEASIBILITY STUDY (PHASE D) - HASTINGS TRACT**

*Prepared for:*

**CALFED BAY-DELTA PROGRAM  
1416 Ninth Street, Suite 1155  
Sacramento, California 95814**

*Applicant:*

**Hastings Island Land Company  
c/o Henry Kuechler, III  
1143 Crane Street, Suite 200  
Menlo Park, California 94025  
Telephone: (415) 328-0820 Fax: (415) 323-5390  
Applicant Type: Private  
Tax I.D. 94-0607290**

*Technical and Financial Contact:*

**Gilbert Cosio Jr.  
Murray, Burns and Kienlen  
Consulting Civil Engineers  
1616 29th Street Suite 300  
Sacramento, California 95816  
Telephone: (916) 456-4400 FAX: (916) 456-0253**

**RFP Project Group Type: Construction**

**I. PROJECT DESCRIPTION:**

Hastings Island Land Company proposes to place fish screens on its gravity intake pipes and relocate the pipes from Cache Slough to Lindsay Slough on Hastings Tract in the Sacramento/San Joaquin Delta. Hastings Tract is located in the northwest region of the Delta in Solano County and encompasses approximately 7,150 acres (Sheet 1). Hastings Island Land Company farms approximately 4,700 of the 7,150 acres. One pump station irrigates 3,000 acres. Located on Hastings Cut, it draws water from Cache Slough via two 48-inch gravity flow pipes and has a maximum capacity of 53 cfs. The large amount of irrigated land from a single diversion point is extremely rare in the Delta.

The principal objectives of this project are to improve agriculture irrigation water quality and reduce the entrainment losses of delta smelt and other priority fish species in Cache Slough at the intake pipes. To accomplish these objectives, the intake pipes would be relocated to Lindsay Slough, and fish screens installed. Water quality in Lindsay Slough is generally better due water movement to the pumps at North Bay Aqueduct and less housing development runoff from the Fairfield/Vacaville/Dixon areas. Both Lindsay Slough and Cache Slough are locations for delta smelt to live and spawn. However, Cache Slough has been identified in the *Federal Register* as a "critical habitat area" for delta smelt. Changing the point of diversion from Cache Slough to Lindsay Slough would benefit delta smelt by reducing entrainment using a screened intake at the new point of diversion.

The proposed project (Phase I) would investigate the feasibility of abandoning the two 48- inch gravity unscreened pipes diverting water from Cache Slough and installing a new gravity intake on the Lindsay Slough end of Hastings Cut. Water would then enter Hastings Cut via the screened intake pipes on Lindsay Slough. The study would evaluate the feasibility of a passive fish screen system at the new pump intake location. Both flat plate and cylindrical screen systems with conventional cleaning systems would be evaluated. A biological study would be conducted to document the existing habitat conditions at both the existing and proposed intake locations. These studies will aid Hastings Island Land Company on a decision to relocate the intake. Should Hastings Island Land Company proceed with construction, the screen design and specifications would comply with criteria described in "*Fish Screen Criteria for Anadromous Salmonids*," National Marine Fisheries Service, Southwest Region (January 1997) and developed in consultation with staff from Department of Water Resources (DWR), Department of Fish & Game (DFG), National Marine Fisheries Service (NMFS) and United States Fish & Wildlife Service (USFWS).

### **TECHNICAL JUSTIFICATION:**

Successful installation of fish screens requires that the type of screen be suitable for the size, location and type of diversion, and be appropriately designed for the physical and hydraulic conditions at the site. In addition, the screen must be effective for the size and species of fish that are vulnerable to entrainment. The alternatives developed in the technical study will take the above factors in consideration and adopt sound technical and proven passive fish screen methods and cleaning systems to ensure an economical and effective installation.

### **BIOLOGICAL JUSTIFICATION:**

Entrainment of fish into agricultural diversions in the Delta is suspected of being a significant source of mortality. The sheer number of diversions represents a potential threat to fish populations, and the timing of water withdrawals often corresponds to periods when juvenile fish are liable to be present and most vulnerable to entrainment. In addition, the siting of diversion intakes may sometimes increase entrainment risk if the intake is located in near-shore, shallow areas that many fish species tend to use as rearing habitat. Installation of a fish screen in the Lindsay and Cache Slough area, where delta smelt populations are known to occur, will have tangible benefits to the ecosystem by reducing mortality of these and other priority species.

### **EXPECTED BENEFITS:**

The fish screen project will provide benefits to many of the priority species identified in the RFP, as well as other native species, by reducing mortality associated with entrainment of fry and juvenile fish. Priority species expected to benefit in Cache Slough include delta smelt, longfin smelt, all runs of chinook salmon, steelhead, and striped bass. This proposal is consistent with CALFED's long-term restoration objectives, benefits multiple species, and has no third-party or redirected impacts. It is also compatible with CALFED objectives for water supply reliability, water quality, and levee system integrity.

### **SCOPE OF WORK:**

To complete the project, two phases are being proposed. Funding is being requested for the Phase I--feasibility study.

#### **Phase I--Feasibility Study:**

1. **Technical Study** — document existing facilities and capacities, survey existing and proposed intake locations, investigate hydraulic conditions at existing

and proposed intake locations, perform hydraulic analysis as needed, evaluate different passive screening systems, conceptual design and cost estimates.

2. **Biological Study** — document existing habitat conditions, evaluate existing data on affected fish and wildlife species, CEQA documentation.

When completed, both technical and biological reports will be submitted to CALFED and all interested parties. Hastings Island Land Company will decide to progress with construction based on these reports and will inform CALFED staff accordingly. If the results of the feasibility study indicate that construction is technically feasible, economical, and environmentally sound, additional funding will be sought from a variety of sources, including CALFED, for Phase II--Construction. The construction phase is described below:

**Phase II--Construction:**

1. **Engineering Design** — final design of fish screen and civil works, plans and specifications for construction, contract administration and project inspection/monitoring.
2. **Biological Consultation** — biological evaluation of fish screen design, consultation with resource agencies, site assessment, refinement of technical and biological monitoring.
3. **Regulatory Permits and Consultation** — prepare regulatory permit applications, oversee permit process.
4. **Construction** — construct fish screen and civil works.
5. **Post-project Technical and Biological Monitoring (3 years)** — evaluate and report on performance and effectiveness of the fish screen.

Should the construction phase proceed, financial and progress reports would be submitted quarterly prior to construction. After construction, technical and biological monitoring reports will be provided once a year after the irrigation season, for three years. Financial reports would include an itemization of all incurred costs per task as described above. Reports would be submitted to CALFED and all interested parties.

## **MONITORING:**

Should the fish screen be constructed, a three-year technical and biological monitoring plan is proposed to evaluate the performance and effectiveness of the fish screen.

Technical monitoring of the fish screen would focus on the mechanical performance of the screen. Daily or weekly inspection logs would be prepared during the operation of the screen. Inspection during operation would document river conditions, debris load, pumping rate, and cleaning cycle timing. After each irrigation season, a technical report will be prepared to report the performance of the screen during the irrigation season.

The monitoring program for the fish screen at Lindsay Slough would be focused on evaluating both hydraulic and biological criteria. These criteria include the following:

1. does the hydraulic performance of the screen match design/regulatory requirements? and
2. is the screen successfully excluding/diverting the species of concern from the water diversions?

Hydraulic performance would be assessed by evaluating approach velocities and sweeping velocities under a range of flow/tidal conditions. Acceptable approach velocities at the screen are expected to be  $\leq 0.20$  feet per second, since the screen will be located in a tidal area where delta smelt may be present. Maintaining a suitably low approach velocity is important to avoid impingement of fish on the screen. Approach velocity will be measured by an electromagnetic (Marsh-McBirney) meter or acoustic meter along a grid pattern, perpendicular to the screen face and approximately three inches in front of the screen surface.

Sweeping velocities across the face of the screen are important to move fish away from the diversion as quickly as possible, thereby providing little opportunity for entrainment or impingement. Sweeping velocities should be twice the approach velocity, and would be measured with the same current meter used for approach velocities. Measurements would be conducted parallel and adjacent to the screen face. A range of measurement locations would be used in order to depict velocity isopleths in the vicinity of the screen.

Biological sampling would be conducted behind the fish screen during the spring, and summer diversion period for three years, and any captured species identified, counted, and measured. Sampling during the first spring and summer of screen operation would occur on a monthly basis. Biological sampling will utilize a fyke net and live box that can be attached

directly to the downstream end of the diversion. The net will be continuously operated during water diversion over 2-3 days for each sampling period.

**IMPLEMENTABILITY:**

Depending on the extent of the preferred fish screen, approval for the project would be required from the U. S. Army Corps of Engineers individual permit or General Permit #34. A streambed alteration agreement would also have to be obtained from the California Department of Fish & Game. Since the project involves a Sacramento River Flood Control Project levee, a Reclamation Board permit is required. It is anticipated that the preferred fish screen would have no significant impacts upon vegetative and aquatic resources, and water quality, therefore, no mitigation is anticipated. The preferred fish screen will adopt technically sound and proven passive fish screen methods and cleaning systems. Expedient permit approval is expected by coordinating the final design and specification of the fish screen with staff from USFWS, DFG and NMFS. If construction funding is approved, construction could begin as early as August 1998 and no later than August 1999. Since the existing facility will not be affected by the construction of the new intake, construction can take place any time without impacting the irrigation operation.

**II. COST AND SCHEDULE:**

Table 1 shows the estimated cost of the tasks described above in "Scope of Work." Funds are requested from CALFED for 100% of the cost for the Phase I feasibility study. Construction funds would be requested from CALFED for the construction phase of the project during the next funding cycle should Hastings Island Land Company proceed with construction. It is anticipated that funds would also be sought from CVPIA Unscreened Diversion Program and other funding possibilities for construction costs.

Table 1

Cost Breakdown							
Project Phase and Task	Direct Labor Hours	Direct Salary & Benefits	Overhead Labor	Service Contracts	Material & Acquisition Contracts	Miscellaneous & other District Costs	Total Cost
Technical Study	—	—	—	\$12,000	—	—	\$12,000
Biological Study	—	—	—	15,000	—	—	15,000
<b>TOTAL</b>	—	—	—	\$27,000	—	—	\$27,000

The project is expected to be constructed before the 1998 irrigation season by adopting the following schedule:

**Phase I—Feasibility Study:**

Technical Study — Nov. 1997 - Jan. 1998  
 Biological Study — Nov. 1997 - Mar. 1998

**Phase II—Construction:**

Engineering & Design — Feb. 1998 to Aug. 1998  
 Biological Consultation — Feb. 1998 to Aug. 1998  
 Regulatory Permits & Consultation — Feb. 1998 to Jul. 1998  
 Construction — Aug. 1998  
 Post-project Monitoring — Aug. 1998 to Nov. 2001  
 Maintenance — Aug. 1998 to Nov. 2001

### **III. APPLICANT QUALIFICATIONS:**

Consistent with Government Code §4525, Murray, Burns and Kienlen, Consulting Civil Engineers, was selected by Hastings Island Land Company to provide engineering and financial services in connection to obtain CALFED funding and construction of project. The selection was made on the basis of qualifications and demonstrated competence for the requested services, including documentation of fair and reasonable prices.

MBK is a consulting civil engineering firm whose main emphasis is water resources. Its three main areas of specialization include water supply planning, flood control and water rights. MBK represents many water diverters located in the Sacramento/San Joaquin Delta watershed. This association has resulted in MBK personnel involvement in many existing and planned fish screening facilities. The services provided include feasibility design and environmental/regulatory. The list of projects includes Pelger Mutual Water Company, Deseret Farms Wilson Ranch, Maxwell Irrigation District, Lower Joice Island, Thousand Acre Ranch, Browns Valley Irrigation District, Grizzly Island and King Island.

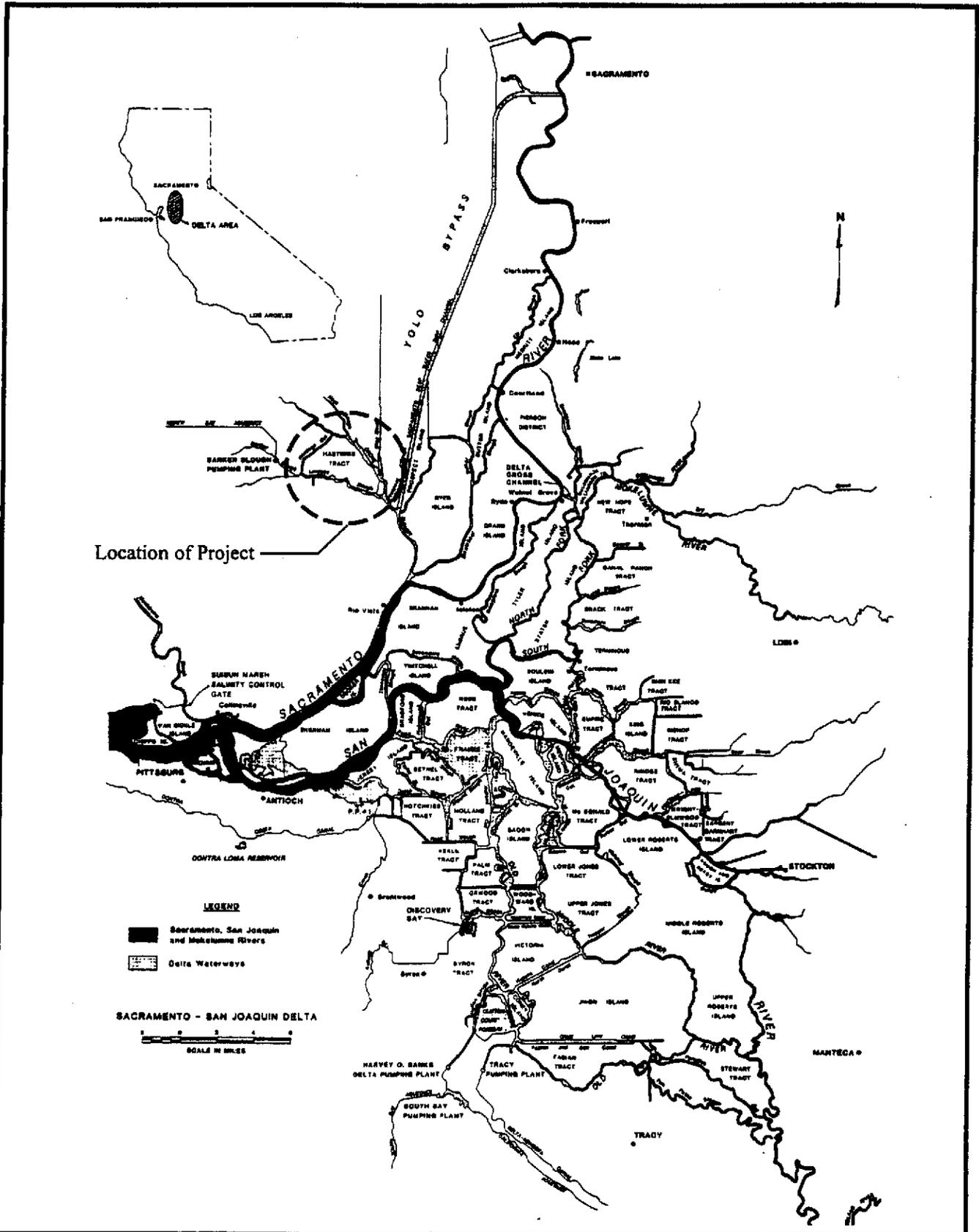
Consistent with Government Code §4525, EA Engineering, Science, and Technology, Inc., was selected by Murray, Burns and Kienlen to provide environmental services in connection with project development and permit processing. The selection was made on the basis of qualifications and demonstrated competence for the requested services, including documentation of fair and reasonable prices.

Pursuant to California Government Code §1090, EA Engineering, Science, and Technology, Inc., is disclosing a remote interest in proposals submitted for funding under CALFED's 1997 Category III program. EA staff, as third tier subcontractors to the Bureau of Reclamation, have provided technical and administrative support to CALFED agency staff in the Restoration Coordination Program. In this capacity, EA staff have assisted with documentation of public meetings of the Ecosystem Roundtable, and compiled technical team meeting information for distribution to Roundtable members and the public. EA's legal counsel has determined that EA's participation as a subconsultant in contracts that may be awarded under the Category III program does not constitute a violation of California Government Code §1090.

EA is a multidisciplinary environmental consulting firm with a staff of Northern California scientists who specialize in environmental analyses related to water resources. EA's staff have been conducting aquatic studies in the Delta and its tributary watersheds for

over 20 years, and have completed entrainment studies on dozens of facilities during that time.

Scott Wilcox of EA Engineering, Science, and Technology is a senior fisheries biologist whose role will involve technical oversight and management of tasks related to biological monitoring and environmental compliance. His areas of technical expertise include aquatic and terrestrial resource impact assessment, fish screen evaluation, and fisheries analyses in riverine and estuarine systems. His 17 years of experience includes biological investigations for approximately 30 projects within or tributary to the Central Valley and the Delta. Many of these projects involved planning of aquatic habitat restoration actions and characterization of fish populations and habitat conditions. Relevant project experience includes biological consultation, design, and monitoring plan development for fish screens on hydro projects; fish population sampling in riverine and estuarine systems; CEQA compliance for habitat restoration and mitigation projects; and TES species surveys. Professional references for similar projects include John Kessler (916-644-1960) of El Dorado Irrigation District and Steve Onken (916-534-1221) of Oroville-Wyandotte Irrigation District.

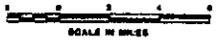


Location of Project

**LEGEND**

-  Sacramento, San Joaquin and Mokelumne Rivers
-  Delta Waterways

SACRAMENTO - SAN JOAQUIN DELTA



**Location Map**

**Hastings Island Land Company**

 **MURRAY BURNS AND KIENLEN - Consulting Civil Engineers**  
 1616 29th Street Ste 300, Sacramento CA 95816 - (916) 436-4400



## NONDISCRIMINATION COMPLIANCE STATEMENT

COMPANY NAME

HASTINGS ISLAND LAND COMPANY (HILCO)

The company named above (hereinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 (a-f) and California Code of Regulations, Title 2, Division 4, Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, disability (including HIV and AIDS), medical condition (cancer), age, marital status, denial of family and medical care leave and denial of pregnancy disability leave.

## CERTIFICATION

*I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.*

OFFICIAL'S NAME

H. N. KUECHLER

DATE EXECUTED

28 JULY 1997

EXECUTED IN THE COUNTY OF  
SAN MATEO

PROSPECTIVE CONTRACTOR'S SIGNATURE

PROSPECTIVE CONTRACTOR'S TITLE

PRESIDENT

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME

KNOB HILL MINES, INC. dba HASTINGS ISLAND LAND COMPANY

TAX ID #94-0607290

Agreement No. \_\_\_\_\_  
Scriber \_\_\_\_\_

**NONCOLLUSION AFFIDAVIT TO BE EXECUTED BY  
BIDDER AND SUBMITTED WITH BID FOR PUBLIC WORKS**

STATE OF CALIFORNIA )  
 )  
COUNTY OF San Mateo )

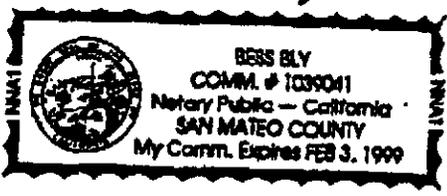
H. N. KUECHLER being first duly sworn, deposes and  
(Name)

says that he/she is PRESIDENT of  
(position title)

HASTINGS ISLAND LAND COMPANY  
(the bidder)

the party making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

DATED: 28 July 97 By [Signature]  
(person signing for bidder)



(Notarial Seal)

Subscribed and sworn to before me on  
July 28, 1997  
[Signature]  
(Notary Public)

# MURRAY, BURNS & KIENLEN

F1-314

A Corporation  
1616 29th Street, Suite 300  
Sacramento, California 95816  
Tel. (916) 456-4400  
FAX (916) 456-0253

## TRANSMITTAL MEMORANDUM

July 28, 1997

**TO:** CALFED Bay-Delta Program  
1416 Ninth Street, Suite 1155  
Sacramento, California 95814

**FROM:** Gilbert Cosio, Jr.  
Murray, Burns and Kienlen

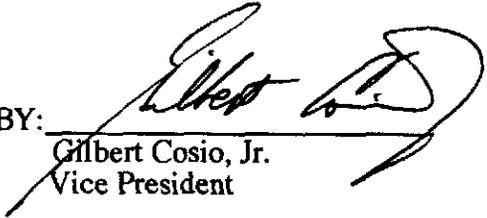
JUL 28 1997

**SUBJECT: Transmittal of 1997 Category III Proposal --  
Hastings Island Land Company**

In accordance with specifications described in the "Request for Proposals, 1997 Category III, Ecosystem Restoration Projects and Programs", transmitted on behalf of Hastings Island Land Company, are the enclosed ten (10) copies of their proposal regarding the "Fish Screen Feasibility Study (Phase I) - Hastings Tract".

If you have any questions, or require additional information, please call me at (916)456-4400.

Sincerely,  
MURRAY, BURNS & KIENLEN

BY:   
Gilbert Cosio, Jr.  
Vice President

cc:  
Mr. H.N. Kuechler III, Hastings Island Land Co.  
Mr. Scott Wilcox

7/28/97  
12:55 PM